modified during the separation stage since the said variation in temperature comprises a temperature or a range of temperatures T2 at which the thermothickening of the medium is carried out as defined above, as well as the variants in which the above cycle is repeated any number of times, preferably in an automated fashion.

In fact, the invention is particularly advantageous in the case of automated electrokinetic separations since it allows automated filling of the separating channel more easily and more rapidly. Moreover, the introduction of the sample may, in the context of the invention, be carried out before, during or after heating a significant portion of the separating channel to the temperature T2.

The subject of the present invention is also the capillary electrophoresis devices, including those based on chips, using, as separation medium, a medium in accordance with the invention. It is particularly useful in the case of electrophoresis devices termed "chip-based" or etched microchannel-based, since, in general, it is more difficult for these devices to tolerate the application of high pressure values for introducing the separation medium than cylindrical capillaries.

The media according to the invention and the separation methods using these media are particularly advantageous for diagnostic, genotyping, high-throughput-screening and quality control applications, or for detecting the presence of genetically modified organisms in a product.

The figures and examples given below are presented by way of nonlimiting illustration of the present invention.

Figures

Figure 1: Variation of the viscosity as a function of the temperature for various copolymers PAM-NIPAM and PDMA-NIPAM, and for a conventional polyacrylamide in solution at 5 g/100 ml in water.

Figures 2: Variation of the viscosity as a function of the temperature for copolymers according to the invention

- the copolymer PAM-NIPAM T10, in water, in a 0.2M K_2CO_3 buffer and a 50 mM Tris-Taps buffer, 7M urea which can be used for the sequencing of DNA (Figure 2a), and
- a copolymer PAM-NIPAM at two different concentrations (2 and 3 g/100 ml) (Figure 2b).

Figures 3: Example of separation of duplex DNA fragments in the 100-12 000 base pair size range ("kb ladder", Life Technologies, Paisley, UK) in a separation medium according to the invention based on a polymer PAM-NIPAM (T15) in solution at 2 g/100 ml in a TRIS-TAPS buffer at 25°C (Figure 3a) and 60°C (Figure 3b).

Figures 4: Electrophoretograms representing the separation of restriction fragments "PhiX-174-RF DNA Hae III digest" (Pharmacia biotech) in a medium according to the invention obtained based on polymer T7, at 20°C (Figure 4a) and at 50°C (Figure 4b).

Figures 5: Example of separation of duplex DNA fragments (100 bp fluorescein ruler, Bio-Rad) in a separation medium according to the invention based on T21 at two temperatures, 20°C (Figure 5a) and 60°C (Figure 5b).

Figures 6: Portions of electrophoretograms representing the separation of a product of reaction of a sequence, obtained with a medium according to the invention based on a copolymer PAM-NIPAM (T10) at 5 g/100 ml in TRIS-TAPS buffer, 7M urea at 60°C (Figure 6c), PAM-NIPAM (T10) at 3 g/100 ml (Figure 6b) and with a commercial sequencing medium (POP6 Perkin-Elmer) (Figure 6a).

Figures 7: Portions of electrophoretograms representing the separation of a product of reaction of a sequence, obtained with a medium according to the invention based on a copolymer PAM-NIPAM (T10) at 5 g/100 ml in TRIS-TAPS buffer, 7M urea at 60°C (Figure 7c), PAM-NIPAM (T10) at 3 g/100 ml (Figure 7b) and with a commercial sequencing medium (POP6 Perkin-Elmer) (Figure 7a).

Figure 8: Electrophoretogram representing the separation of large duplex DNA "high Mw markers" (Life Technologies, Paisley, GB), by pulsed electrophoresis in a medium according to the invention obtained based on polymer T10 at 60°C.

Figure 9: Variation of the viscosity as a function of the temperature for

- a copolymer PVA-NIPAM, compared with that of a polymer PVA, and

- a copolymer POP-POE-POP in relation to that of the polymer POE at a concentration of 5 g/100 ml.

Figures 10: Example of separation of duplex DNA fragments in the 50-500 base pair size range (sizer 50-500 bp, Pharmacia biotech) in a separation medium according to the invention based on PVA-NIPAM at two temperatures, 20°C (Figure 10a) and 40°C (Figure 10b).

Figures 11: Electrophoretograms representing the separation of the sizer 50-500 bp, Pharmacia biotech,